

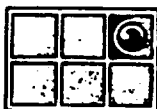
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ORIGINAL
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REVISED GROUNDWATER MONITORING PROGRAM

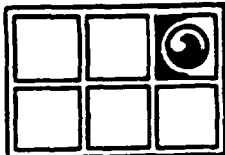
KIMBERTON, PENNSYLVANIA

(Previous Submission 17 May 1983)



GROUNDWATER TECHNOLOGY, INC.

AR300405



GROUNDWATER TECHNOLOGY

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(Previous Submission 17 May 1983)

26 February 1985

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CONSULTING GROUNDWATER GEOLOGISTS WITH OFFICES WORLDWIDE

AR300406

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INTRODUCTION

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This document presents a finalized program of groundwater monitoring to be conducted in Kimberton, Pennsylvania for Monsey Products Company and Ciba-Geigy Corporation. The work steps described herein represent the combination of several previous proposals in a single, coherent program. During the recent meeting of 13 February 1985, this monitoring program was met with mutual agreement by Monsey/Ciba-Geigy and the Pennsylvania Department of Environmental Resources (DER). In response to a request by DER, a detailed summary of this program is presented herein.

WORK SCOPE

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The purpose of this program is to provide comprehensive assessment of groundwater and contaminant movement both within Monsey property limits and in the down gradient direction immediately beyond the confines of Monsey Property. To accomplish this objective, the following tasks will be implemented:

- Installation of thirteen monitoring wells (Figure 1). Seven of these wells will be installed on the site presently owned by Monsey Products in areas not presently covered by the monitoring of existing on-site wells (wells 1 through 4). The remaining six wells are to be installed beyond the confines of Monsey property in areas selected for their structural or down gradient significance relative to the Monsey site. All well locations have been mutually agreed upon by Monsey/Ciba-Geigy and DER via earlier meetings and correspondence and during their meeting of 13 February.
- Implementation of a groundwater sampling and analysis program subsequent to the completion of monitoring well installation.
- Interpretation of field and laboratory data to determine groundwater flow patterns and actual or potential routes of contaminant plume migration.

Actual work steps for each of these tasks are outlined in ensuing sections.

WELL INSTALLATION

The following work steps and procedures will be implemented relative to installation of the thirteen additional monitoring wells noted previously:

1. Secure all necessary permits for monitoring well installation. The process of obtaining individual property owner permission for off-site well installation has been completed.
2. Finalize drilling arrangements with a competent, experienced well driller. It is currently anticipated that F. L. Bollinger and Sons of Blue Bell, Pennsylvania will be contracted for well drilling and installation.
3. Review observation well locations in the field with the well driller, Monsey Products, individual property owners, and DER (should they so desire) to verify location and accessibility with all parties involved.
4. Install thirteen monitoring wells at locations shown on Figure 1. All wells will be installed under the direction of a competent hydrogeologist. Two types of well installations are anticipated. If competent bedrock conditions are encountered, the monitoring well will be cased with six-inch (I.D.) steel casing to rock and left as an open hole below that point (Figure 2). If incompetent or unstable subsurface conditions are encountered, four-inch (I.D.), 0.02 slotted PVC well screen will be installed to a minimum of ten feet above the static water table (Figure 3). All installed well screen will be appropriately gravel-packed and the resulting well annulus sealed with a bentonite cap within five feet of the surface (Figure 3).

On-site wells will be completed as above grade installations. Off-site wells will be completed flush with the existing ground surface via man-hole covers. All wells will have locking caps and be grout-sealed at the surface.

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5. Individual monitoring well depth will be a field determination based on obtaining a saturated thickness within the well bore to gain a sufficient water supply to adequately purge the water bearing zone during well development. It is currently anticipated that average well depth will be approximately 60 feet. Although significantly shallower depths to water may be encountered, no well shall be installed less than 30 feet in depth.
6. The drill rig and all drilling-related equipment will be steam cleaned between borings to preclude the possibility of equipment induced cross contamination. Drilling wastes will be disposed of in an appropriate manner.
7. Pumping and purging of newly completed monitoring wells to ensure proper development. This program can proceed concurrently with well installation.
8. All wells will be vertically and horizontally located by field survey. Top of well casings will be surveyed to ± 0.01 feet to develop elevation control for water table contouring.

GROUNDWATER SAMPLING AND ANALYSIS

The program of monitoring local groundwater conditions combines field and laboratory procedures. Work steps involved in this process are presented below.

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1. Water quality sampling will be initiated within two weeks of completion of the monitoring well installation program. This program will be completed no later than 15 May. During the first six months of monitoring, four rounds of sampling shall be conducted after which quarterly sampling will be performed. Intervals of sampling are presented in Table 1.
2. Groundwater sampling points will consist of existing Monsey wells #1 through #4, Monsey's President's house well, and the thirteen new monitoring wells to be installed under this program. Subsequent to the first round of samples, well #1 will be deleted from the sampling program as other existing wells in the immediate vicinity will provide representative sampling of the groundwater regime.
3. Samples are to be analyzed for volatile organic compounds, total dissolved solids, pH, and chlorides. Wells #2 and #7 will be analyzed for base neutral compounds during the second and third round of sampling and yearly thereafter pending sample results. Analytical parameters are presented in Table 1. It is currently anticipated that it may be possible to eliminate selected compounds from the analytical program should they be proven consistently non detectable. Similar adjustments may also prove possible with regard to the monitoring network.

4. All samples from monitoring wells will be obtained in accordance with EPA Manual of Groundwater Sampling Procedure (1981) to ensure that samples of representative aquifer quality are procured for analysis. Stabilization of specific conductivity and temperature (sec) during well pumping will be used to insure that sufficient water has been removed from the well bore prior to sampling.
5. Liquid level data will be collected from all available monitoring points immediately prior to each round of sampling and on a minimum monthly basis for the purposes of water table fluctuation and gradient analysis.

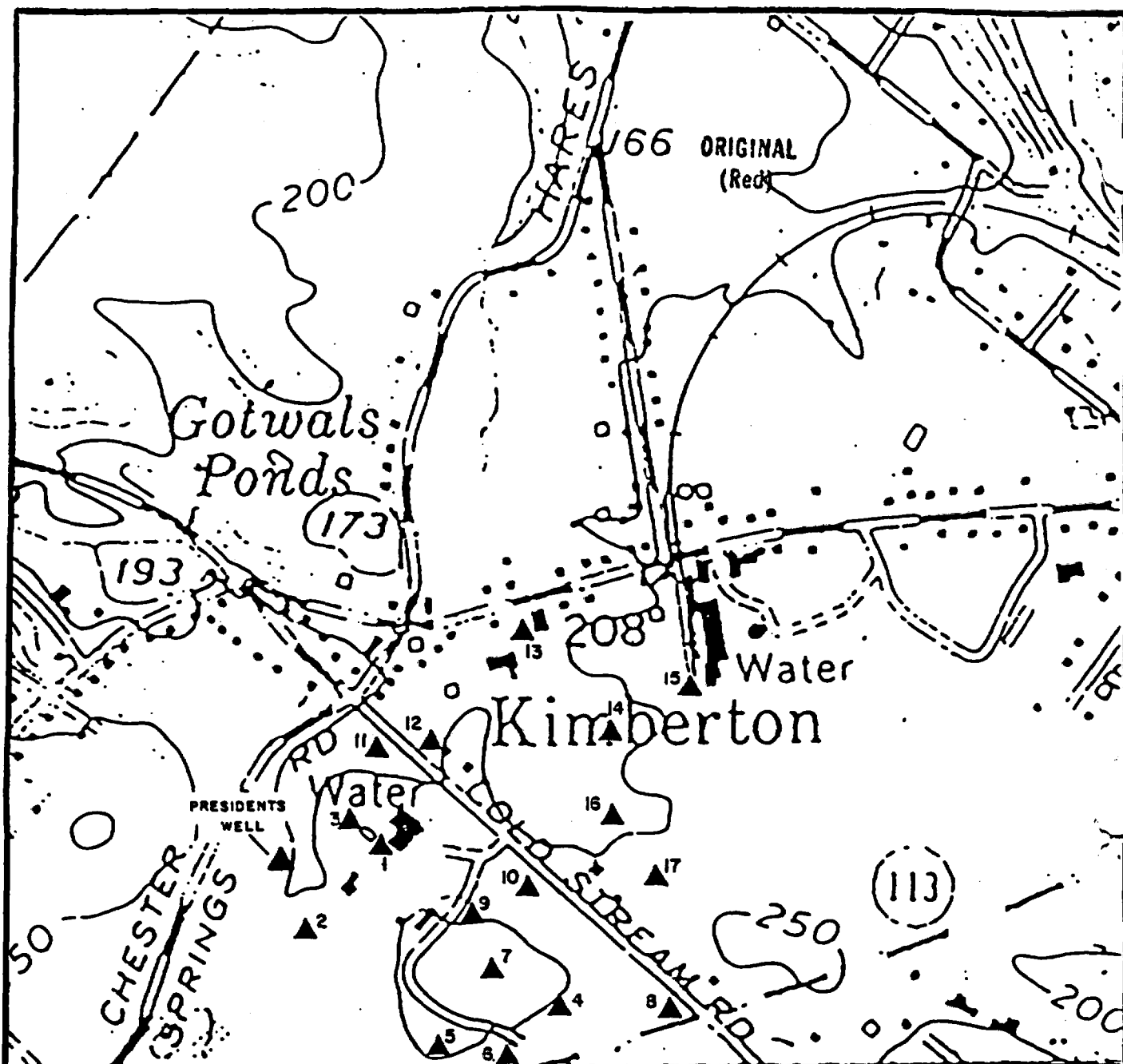
DATA ANALYSIS AND INTERPRETATION

Upon initiation of data base compilation for the Monsey Products site, the following program of data analysis and interpretation will be implemented: ORIGINAL (k60)

1. Construction of representative water table contour maps to determine local groundwater gradient.
2. Upon receipt of analytical data, isoconcentration maps will be constructed for representative individual or groups of compounds to determine dynamic characteristics of contaminant plume migration. Copies of all analytical data will be forwarded to DER within three weeks of receipt.
3. Analysis of groundwater movement and contaminant migration will be combined to interpret overall site conditions.
4. All data and resulting analyses will be presented to DER in an interim report. This report is to be provided to DER within six months of the completion of monitoring well installation. Recommendations for modification of the monitoring program will be included as needed. This interim evaluation will serve as a progress report and thus will not include recommendations concerning ultimate site disposition.
5. A comprehensive report detailing the findings of the groundwater monitoring program will be presented to DER after one full year of monitoring. This report will detail the dynamic changes of the contaminant plume and provide recommendations concerning further site activity.

6. The documents noted in items 4 and 5 will be included in a Remedial Investigation (RI) report which will be prepared for DER subsequent to a minimum of one year's site monitoring.

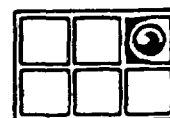
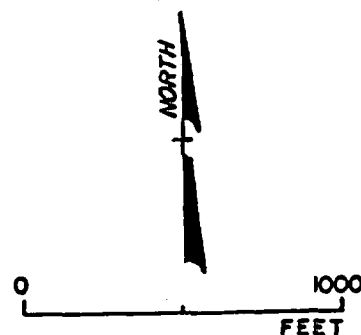
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- ▲ MONITORING WELL
 WELLS 1-4: EXISTING ON SITE
 WELLS 5-11: PROPOSED ON SITE
 WELLS 12-17: PROPOSED OFF SITE

FIGURE 1
 EXISTING & PROPOSED
 MONITORING WELLS
 MONSEY / CIBA-GEIGY
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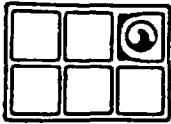
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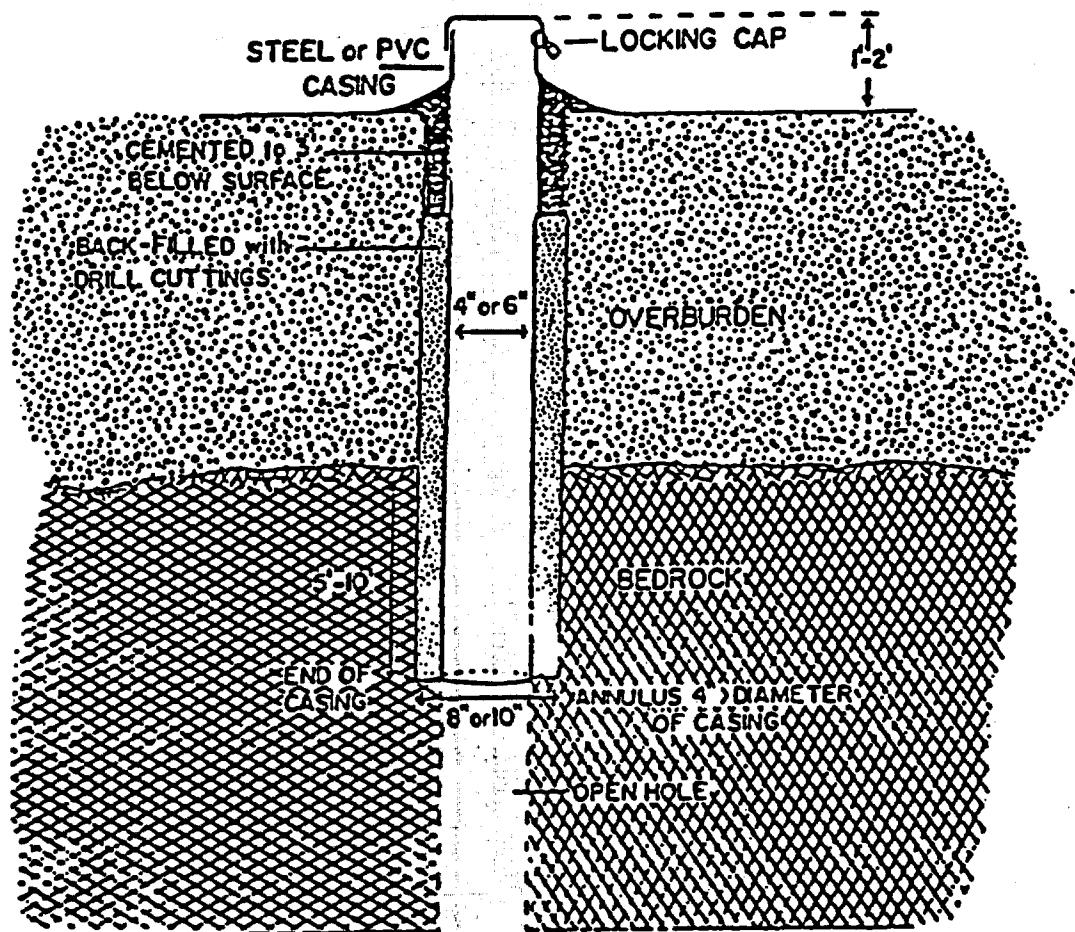


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FIGURE 2
SCHEMATIC of a
MONITORING WELL
for
CONSOLIDATED GEOLOGIC FORMATIONS



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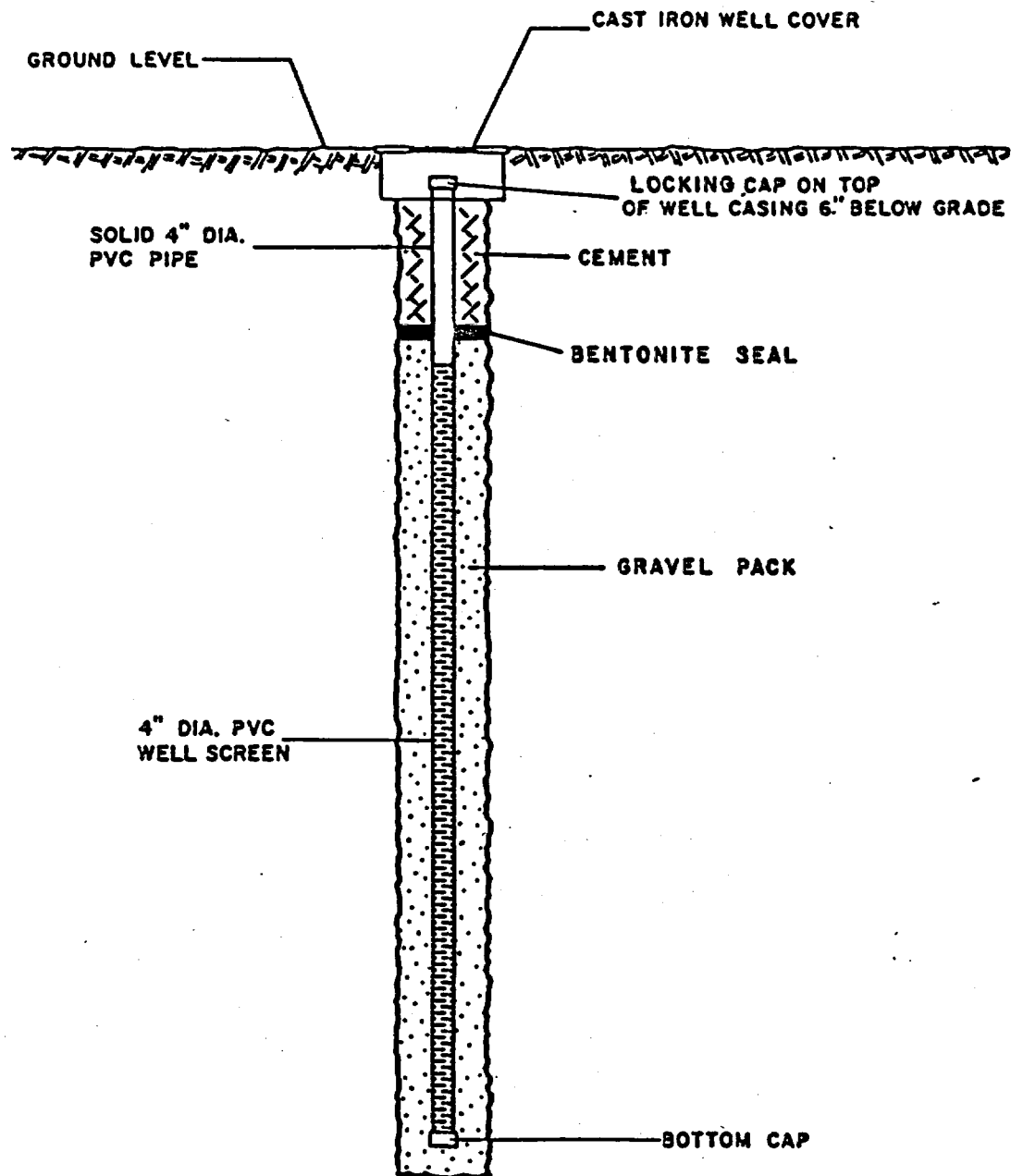
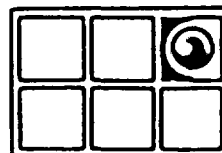


FIGURE 3
TYPICAL OBSERVATION WELL



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MONSEY PRODUCTS COMPANY
Kimberton, PA

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TABLE 1 - SAMPLING SCHEDULE AND ANALYSIS PARAMETERS

Time From Drilling Completion	Time From Last Sampling	Date Deadline	Wells	Parameters
2 weeks	--	15 May 85	MW #1 through #17, President's well	Volatile organics, TDS, pH, chlorides
4 weeks	2 weeks	29 May 85	MW #2 through #17, President's well	Volatile organics, TDS, pH, chlorides, base neutrals in wells #2 and #7
2 months	1 month	1 July 85	Same as above	Volatile organics, TDS, pH, chlorides, base neutrals in wells #2 and #7
5 months	3 months	1 Oct. 85	Same as above	Volatile organics, TDS, pH chlorides
9 months	4 months	1 Feb. 86	To be decided	To be decided
12 months	3 months	1 May 86	To be decided	To be decided

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